

U.S. Patent Application Serial No. 09/147,052  
Amendment Accompanying RCE dated May 12, 2004  
Reply to OA of November 13, 2003

***IN THE CLAIMS***

Please cancel claim 42 without prejudice or disclaimer. Please amend claims 20, 25-30, 32-33, 41, 43 and 44, as follows:

**Claims 1-19 (Canceled).**

**Claim 20 (Currently amended):** A fusion protein, comprising:

(i) an antigenic protein isolated from ~~Mycoplasma gallisepticum~~ Mycoplasma gallisepticum that causes causing an antibody-antigen reaction with ~~Mycoplasma gallisepticum~~ Mycoplasma gallisepticum immune serum or ~~Mycoplasma gallisepticum~~ Mycoplasma gallisepticum infected serum, and

(ii) a signal polypeptide of Herpesvirus outer membrane protein, said signal polypeptide being ligated with said antigenic protein isolated from ~~Mycoplasma gallisepticum~~ Mycoplasma gallisepticum at the N terminus thereof such that, thereby to secrete said antigenic protein is secreted extracellularly, and

wherein upon expression of said fusion protein in a host cell, said antigenic protein is secreted extracellularly.

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**Claim 21 (Original):** A fusion protein according to claim 20, wherein a sequence of said antigenic protein is amino acids 64-456 of SEQ ID NO:2 or amino acids 693-1086 of SEQ ID NO:4.

**Claim 22 (Previously presented):** A fusion protein according to claim 20, wherein said signal polypeptide is isolated from a herpes virus showing infection to fowl.

**Claim 23 (Previously presented):** A fusion protein according to claim 22, wherein said signal polypeptide is isolated from a Marek's disease virus.

**Claim 24 (Previously presented):** A fusion protein according to claim 23, wherein said signal polypeptide is gB protein isolated from a Marek's disease virus.

**Claim 25 (Currently amended):** A recombinant Avipox virus having a DNA coding for a fusion protein, comprising:

(i) an antigenic protein isolated from ~~Mycoplasma gallisepticum~~ Mycoplasma gallisepticum that causes and causing an antibody-antigen reaction with ~~Mycoplasma gallisepticum~~ Mycoplasma gallisepticum infected serum, and

(ii) a signal polypeptide of Herpesvirus outer membrane protein, said signal polypeptide being ligated with said antigenic protein isolated from ~~Mycoplasma gallisepticum~~ Mycoplasma gallisepticum at the N terminus thereof such that, thereby to secrete said antigenic protein is secreted extracellularly, and

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wherein upon expression of said fusion protein in a host cell, said antigenic protein is secreted extracellularly.

**Claim 26 (Currently amended):** A recombinant live vaccine for use in fowl against anti-fowl ~~Mycoplasma gallisepticum~~ Mycoplasma gallisepticum infection, comprising as an effective ingredient a recombinant Avipox virus comprising having a DNA coding for a fusion protein, comprising:

(i) an antigenic protein isolated from ~~Mycoplasma gallisepticum~~ Mycoplasma gallisepticum that causes and causing an antibody-antigen reaction with ~~Mycoplasma gallisepticum~~ Mycoplasma gallisepticum immune serum or ~~Mycoplasma gallisepticum~~ Mycoplasma gallisepticum infected serum, and

(ii) a signal polypeptide of Herpesvirus outer membrane protein, said signal polypeptide being ligated with said antigenic protein isolated from ~~Mycoplasma gallisepticum~~ Mycoplasma gallisepticum at the N terminus thereof such that, ~~thereby to secrete~~ said antigenic protein is secreted extracellularly, and

wherein ~~the~~ said fusion protein ~~is capable~~, upon administration into a host cell, ~~of immunizing that~~ immunizes said host cell against subsequent infection with ~~Mycoplasma gallisepticum~~ Mycoplasma gallisepticum, and said antigenic protein is secreted extracellularly..

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**Claim 27 (Previously presented):** A fusion protein according to claim 20, wherein a sequence of said signal polypeptide is amino acids 1-63 of SEQ ID NO:2 or amino acids 1-672 of SEQ ID NO:4.

**Claim 28 (Previously presented):** A fusion protein according to claim 20, wherein

(a) a sequence of said signal polypeptide is amino acids 1-63 of SEQ ID NO:2 and a sequence of said antigenic protein is amino acids 64-456 of SEQ ID NO:2, or

(b) a sequence of said signal polypeptide is amino acids 1-672 of SEQ ID NO:4, and a sequence of said antigenic protein is amino acids 693-1086 of SEQ ID NO:4.

**Claim 29 (Currently amended):** A fusion protein according to claim 20, wherein said antigenic protein causes an antibody-antigen reaction with ~~Mycoplasma gallisepticum~~ Mycoplasma gallisepticum immune serum or ~~Mycoplasma gallisepticum~~ Mycoplasma gallisepticum infected serum in vivo in vivo.

**Claim 30 (Currently amended):** A fusion protein according to claim 28, wherein said antigenic protein causes an antibody-antigen reaction with ~~Mycoplasma gallisepticum~~ Mycoplasma gallisepticum immune serum or ~~Mycoplasma gallisepticum~~ Mycoplasma gallisepticum infected serum in vivo in vivo.

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**Claim 31 (Withdrawn):** A DNA coding for a fusion protein comprising

(i) an antigenic protein isolated from Mycoplasma gallisepticum causing an antibody-antigen reaction with Mycoplasma gallisepticum immune serum or Mycoplasma gallisepticum infected serum, and

(ii) a signal polypeptide of Herpesvirus outer membrane protein, said signal polypeptide being ligated with said antigen protein isolated from Mycoplasma gallisepticum at the N terminus thereof, thereby to secrete said antigenic protein extracellularly,

wherein said DNA comprises

(i) a first DNA segment isolated from Mycoplasma gallisepticum and coding for an antigenic protein causing an antibody-antigen reaction with Mycoplasma gallisepticum immune serum or Mycoplasma gallisepticum infected serum, and

(ii) a second DNA segment isolated from a Marek's disease virus gene and coding for outer membrane protein signal sequence, said first and second DNA segments being ligated to each other.

**Claim 32 (Currently amended):** A recombinant Avipox virus ~~having~~ comprising a DNA coding for a fusion protein, comprising:

(i) an antigenic protein isolated from ~~Mycoplasma gallisepticum~~ Mycoplasma gallisepticum ~~that causes and causing~~ an antibody-antigen reaction with ~~Mycoplasma gallisepticum~~ Mycoplasma gallisepticum immune serum or ~~Mycoplasma gallisepticum~~ Mycoplasma gallisepticum infected serum, and

(ii) a signal polypeptide of Herpesvirus outer membrane protein, said signal polypeptide being ligated with said antigenic protein isolated from ~~Mycoplasma gallisepticum~~ Mycoplasma gallisepticum at the N terminus thereof such that, thereby to secrete said antigenic protein is secreted extracellularly, and

wherein said DNA comprises:

(i) a first DNA segment isolated from ~~Mycoplasma gallisepticum~~ Mycoplasma gallisepticum ~~that codes and coding~~ for an antigenic protein which causes ~~causing~~ an antibody-antigen reaction with ~~Mycoplasma gallisepticum~~ Mycoplasma gallisepticum immune serum or ~~Mycoplasma gallisepticum~~ Mycoplasma gallisepticum infected serum, and

(ii) a second DNA segment isolated from a Marek's disease virus gene ~~and coding for that~~ codes for a signal polypeptide of Herpesvirus outer membrane protein ~~signal sequence~~, said first and second DNA segments being ligated to each other such that said antigenic protein is secreted extracellularly, and

wherein upon expression of said fusion protein in a host cell, said antigenic protein is secreted extracellularly.

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**Claim 33. (Currently amended):** A recombinant live vaccine for use in fowl against anti-fowl ~~Mycoplasma gallisepticum~~ *Mycoplasma gallisepticum* infection comprising as an effective ingredient a recombinant Avipox virus having a DNA coding for a fusion protein, comprising:

(i) an antigenic protein isolated from ~~*Mycoplasma gallisepticum*~~ *Mycoplasma gallisepticum* that causes and causing an antibody-antigen reaction with ~~*Mycoplasma gallisepticum*~~ *Mycoplasma gallisepticum* immune serum or ~~*Mycoplasma gallisepticum*~~ *Mycoplasma gallisepticum* infected serum, and

(ii) a signal polypeptide of Herpesvirus outer membrane protein, said signal polypeptide being ligated with said antigenic protein isolated from ~~*Mycoplasma gallisepticum*~~ *Mycoplasma gallisepticum* at the N terminus thereof such that, thereby to secrete said antigenic protein is secreted extracellularly, and

wherein said DNA comprises:

(i) a first DNA segment isolated from ~~*Mycoplasma gallisepticum*~~ *Mycoplasma gallisepticum* that codes and coding for an antigenic protein which causes causing an antibody-antigen reaction with ~~*Mycoplasma gallisepticum*~~ *Mycoplasma gallisepticum* immune serum or ~~*Mycoplasma gallisepticum*~~ *Mycoplasma gallisepticum* infected serum, and

(ii) a second DNA segment isolated from a Marek's disease virus gene and coding for that codes for a signal polypeptide of Herpesvirus outer membrane protein signal sequence, said first and second DNA segments being ligated to each other such that said antigenic protein is secreted extracellularly, and

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wherein the said fusion protein is ~~capable~~, upon administration into a host cell, of immunizing that immunizes said host cell against subsequent infection with ~~Mycoplasma gallisepticum~~ *Mycoplasma gallisepticum*, and said antigenic protein is secreted extracellularly.

**Claim 34 (Withdrawn):** A DNA according to claim 31, wherein said second DNA segment is isolated from a herpes virus showing infection to fowl.

**Claim 35 (Withdrawn):** A DNA according to claim 31, wherein said signal polypeptide is isolated from a Marek's disease virus.

**Claim 36 (Withdrawn):** A DNA according to claim 31, wherein said signal polypeptide is isolated from DNA coding for gB protein of a Marek's disease virus.

**Claim 37 (Withdrawn):** A DNA according to claim 31, wherein a sequence of said second DNA segment is codons 1-63 of SEQ ID NO:1 or codons 1-672 of SEQ ID NO:3.

**Claim 38 (Withdrawn):** A DNA according to claim 31, wherein a sequence of said DNA is SEQ ID NO:1 or SEQ ID NO:3.



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**Claim 39 (Previously presented):** A recombinant Avipox virus according to claim 32, wherein a sequence of said second DNA is codons 1-63 of SEQ ID NO:1 or codons 1-672 of SEQ ID NO:3.

**Claim 40 (Previously presented):** A recombinant Avipox virus according to claim 32, wherein a sequence of said DNA is SEQ ID NO:1 or SEQ ID NO:3.

**Claim 41 (Currently amended):** A recombinant Avipox virus according to claim 32, wherein said antigenic protein causes an antibody-antigen reaction with Mycoplasma gallisepticum Mycoplasma gallisepticum immune serum or Mycoplasma gallisepticum Mycoplasma gallisepticum infected serum ~~in vivo~~ in vivo.

**Claim 42 (Canceled).**

**Claim 43 (Currently amended):** A recombinant virus according to claim 32, wherein said fusion protein does not include a membrane anchor peptide sequence.

**Claim 44 (Currently amended):** A recombinant Avipox virus according to claim 32, wherein, when an avian cell is infected with said recombinant virus ~~is infected into an avian cell~~, said antigenic protein is secreted outside the said avian cell.

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**Claim 45 (Withdrawn):** A recombinant live vaccine according to claim 26, wherein a sequence of said DNA is SEQ ID NO:1.

**Claim 46 (Withdrawn):** A recombinant live vaccine according to claim 26, wherein a sequence of said DNA is SEQ ID NO:3.